

U. S. Patent Application No. 10/715,521
Response to OA mailed 09/05/2008

Attorney Docket: 520.43271X00

IN THE CLAIMS

This listing of the claim will replace all prior versions and listings of claim in the present application.

Listing of Claims

1. (currently amended): An information transmission system comprising:
 - a timer;
 - a first transmission line;
 - a second transmission line; and
 - a plurality of transmission terminals that are connected to both the first transmission line and the second transmission line,wherein each of said transmission terminals comprises:
 - a relaying ~~means,~~means;
 - a device controller comprising a device control block; and
 - a communication controller comprising a storage area,
 - wherein the storage area comprises a status table, and
 - wherein the status table comprises:
 - a first counter that indicates that data has been received;
 - a second counter that indicates that no data has been
received;
 - a repetition required flag that indicates that there is no
data reception during a preset time period and that data repetition is
required; and
 - a third counter that indicates that data repetition is
required.

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wherein the third counter is assigned a value when the repetition required flag is set to indicate that data repetition is required,

wherein each of said transmission terminals receives information from a sender via one or both of the first transmission line and the second transmission line,

wherein each of the transmission terminals determines whether a failure has occurred on either the first transmission line or the second transmission line by checking whether the information is being transferred on the first transmission line and is not being transferred on the second transmission line,

wherein a determination that the information is being transferred on the first transmission line and is not being transferred on the second transmission line indicates a failure has occurred on the second transmission line,

wherein when no failure occurs on the first transmission line and no failure occurs on the second transmission line, the relaying means of the transmission terminals do not relay the information to the first transmission line or the second transmission line, and each of the transmission terminals receives the information from the sender via both the first transmission line and the second transmission line, ~~and~~

wherein when a failure occurs on the first transmission line, such that a first transmission terminal determines that the information is being transferred on the first transmission line and is not being transferred on the second transmission line, the first transmission terminal receives the information from the sender via the first transmission line, and ~~the~~ a first relaying means of the first transmission terminal transfers the received information to the second

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transmission line such that the information is present on both the first
transmission line and the second transmission line at the first terminal,
wherein the timer starts at the start of reception of the information by
each of said transmission terminals,

wherein the first transmission terminal:

(a) increments the first counter when the first transmission terminal
receives the information from the first transmission line;

(b) determines whether the information is being transmitted from the
second transmission line when no information is received by the first
transmission terminal;

(c) checks the repetition required flag and the third counter to
determine whether data repetition is required when the information is being
transmitted from the second transmission line;

(d) relays the information to the first transmission line and sends the
information to the device control block when the repetition required flag and
the third counter indicate that data repetition is required;

(e) discards the information when data repetition is not required; and

(f) determines whether the timer has reached a preset time,

wherein when the first transmission terminal determines that the timer
has not reached the preset time, the first transmission terminal repeats (a)-(f),
and

wherein when the first transmission terminal determines that the timer
has reached the preset time, the first transmission terminal:

increments the second counter and resets the first counter;

sets the repetition required flag to indicate that there is no data

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reception during the preset time period and that data repetition is required;

decrements the third counter; and

resets the timer.

2. (original): The information transmission system according to claim 1, wherein said information transmission system is equipped with a means which preferentially relays information to a relaying means of a transmission terminal close to said sender.

3.-4. (canceled).

5. (previously presented): The information transmission system according to claim 1,

wherein each of said transmission terminals is equipped with means to send information from said terminal to the other transmission terminal, and

wherein each of said transmission terminals is equipped with means to send information from said terminal to the other transmission terminal over one of said first transmission line and said second transmission line if determined to be necessary.

6. (original): The information transmission system according to claim 5, wherein said information transmission system is equipped with a means which preferentially relays information to a relaying means of a transmission terminal close to said sender.

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7. (currently amended): An information transmission system for
railway vehicles comprising:

a timer;

a first transmission line and a second transmission line which connect
a plurality of vehicles constituting a railway train; and

a plurality of transmission terminals which are connected to said first
transmission line and said second transmission line,

wherein each of said transmission terminals comprises:

a relaying ~~means,~~means;

a device controller comprising a device control block; and

a communication controller comprising a storage area,

wherein the storage area comprises a status table, and

wherein the status table comprises:

a first counter that indicates that data has been received;

a second counter that indicates that no data has been
received;

a repetition required flag that indicates that there is no
data reception during a preset time period and that data repetition is
required; and

a third counter that indicates that data repetition is
required,

wherein the third counter is assigned a value when the
repetition required flag is set to indicate that data repetition is required,

wherein each of said transmission terminals in respective vehicles
receives information from a sender in one of the respective vehicles

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separately via one or both of the first transmission line and the second transmission line, wherein each of the transmission terminals determines whether a failure has occurred on either the first transmission line or the second transmission line by checking whether the information is being transferred on the first transmission line and is not being transferred on the second transmission line,

wherein a determination that the information is being transferred on the first transmission line and is not being transferred on the second transmission line indicates a failure has occurred on the second transmission line,

wherein when no failure occurs on the first transmission line and no failure occurs on the second transmission line, the relaying means of the transmission terminals do not relay the information to the first transmission line or the second transmission line, and each of the transmission terminals receives the information from the sender via both the first transmission line and the second transmission line, and

wherein when a failure occurs on the first transmission line, such that a first transmission terminal determines that the information is being transferred on the first transmission line and is not being transferred on the second transmission line, the first transmission terminal receives the information from the sender via the first transmission line, and the a first relaying means of the first transmission terminal transfers the received information to the second transmission line such that the information is present on both the first transmission line and the second transmission line at the first terminal,

wherein the timer starts at the start of reception of the information by each of said transmission terminals.

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wherein the first transmission terminal:

(a) increments the first counter when the first transmission terminal receives the information from the first transmission line;

(b) determines whether the information is being transmitted from the second transmission line when no information is received by the first transmission terminal;

(c) checks the repetition required flag and the third counter to determine whether data repetition is required when the information is being transmitted from the second transmission line;

(d) relays the information to the first transmission line and sends the information to the device control block when the repetition required flag and the third counter indicate that data repetition is required;

(e) discards the information when data repetition is not required; and

(f) determines whether the timer has reached a preset time,

wherein when the first transmission terminal determines that the timer has not reached the preset time, the first transmission terminal repeats (a)-(f), and

wherein when the first transmission terminal determines that the timer has reached the preset time, the first transmission terminal:

increments the second counter and resets the first counter;

sets the repetition required flag to indicate that there is no data reception during the preset time period and that data repetition is required;

decrements the third counter; and

resets the timer.

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8. (canceled).

9. (currently amended): The information transmission system according to claim 7, wherein each of said railway vehicles has two of said transmission terminals, each of which has a means to respectively send information over one of said first transmission line and said second transmission line when said transmission terminal sends information from the vehicle having the transmission terminal to the other vehicle, if necessary.

10. (currently amended): An information transmission method of an information transmission system, wherein said information transmission system comprises a timer, a first transmission line, a second transmission line, and a plurality of transmission terminals which are connected to both of said first transmission line and said second transmission line, wherein each of the transmission terminals comprises: a relaying means; means; a device controller comprising a device control block; and a communication controller comprising a storage area, wherein the storage area comprises a status table, and wherein the status table comprises: a first counter that indicates that data has been received; a second counter that indicates that no data has been received; a repetition required flag that indicates that there is no data reception during a preset time period and that data repetition is required; and a third counter that indicates that data repetition is required, wherein the third counter is assigned a value when the repetition required flag is set to indicate that data repetition is required, and wherein said method comprises the steps of:

causing said transmission terminals to receive information from a sender separately via one or both of the first transmission line and the second transmission line; and

determining, by each of the transmission terminals, whether a failure has occurred on either the first transmission line or the second transmission line by checking whether the information is being transferred on the first transmission line and is not being transferred on the second transmission line,

wherein a determination that the information is being transferred on the first transmission line and is not being transferred on the second transmission line indicates a failure has occurred on the second transmission line,

wherein when no failure occurs on the first transmission line and no failure occurs on the second transmission line, the relaying means of the transmission terminals do not relay the information to the first transmission line or the second transmission line, and each of the transmission terminals receives the information from the sender via both the first transmission line and the second transmission line, and

wherein when a failure occurs on the first transmission line, such that a first transmission terminal determines that the information is being transferred on the first transmission line and is not being transferred on the second transmission line, the first transmission terminal receives the information from the sender via the first transmission line, and ~~the~~ a first relaying means of the first transmission terminal transfers the received information to the second transmission line such that the information is present on both the first transmission line and the second transmission line at the first terminal,

wherein the timer starts at the start of reception of the information by each of said transmission terminals.

wherein the first transmission terminal performs the steps of:

(a) incrementing the first counter when the first transmission terminal receives the information from the first transmission line;

(b) determining whether the information is being transmitted from the second transmission line when no information is received by the first transmission terminal;

(c) checking the repetition required flag and the third counter to determine whether data repetition is required when the information is being transmitted from the second transmission line;

(d) relaying the information to the first transmission line and sends the information to the device control block when the repetition required flag and the third counter indicate that data repetition is required;

(e) discarding the information when data repetition is not required; and

(f) determining whether the timer has reached a preset time,

wherein when the first transmission terminal determines that the timer has not reached the preset time, the first transmission terminal repeats (a)-(f), and

wherein when the first transmission terminal determines that the timer has reached the preset time, the first transmission terminal performs the steps of:

incrementing the second counter and resets the first counter;

setting the repetition required flag to indicate that there is no data reception during the preset time period and that data repetition is required;

decrementing the third counter; and
resetting the timer.

11. (canceled).

12. (new): A transmission terminal that receives information from one or both of a first transmission line and a second transmission line, the transmission terminal comprising:

a device controller comprising a device control block; and

a communication controller comprising a storage area,

wherein the storage area comprises a status table,

wherein the status table comprises:

a first counter that indicates that data has been received;

a second counter that indicates that no data has been received;

a repetition required flag that indicates that there is no data reception during a preset time period and that data repetition is required; and

a third counter that indicates that data repetition is required,

wherein the third counter is assigned a value when the repetition required flag is set to indicate that data repetition is required,

wherein a timer starts at the start of reception of the information by said transmission terminal,

wherein the transmission terminal:

(a) increments the first counter when the transmission terminal receives the information from the first transmission line;

(b) determines whether the information is being transmitted from the second transmission line when no information is received by the transmission terminal;

(c) checks the repetition required flag and the third counter to determine whether data repetition is required when the information is being transmitted from the second transmission line;

(d) relays the information to the first transmission line and sends the information to the device control block when the repetition required flag and the third counter indicate that data repetition is required;

(e) discards the information when data repetition is not required; and

(f) determines whether the timer has reached a preset time, wherein when the transmission terminal determines that the timer has not reached the preset time, the transmission terminal repeats (a)-(f), and wherein when the transmission terminal determines that the timer has reached the preset time, the transmission terminal:

increments the second counter and resets the first counter;

sets the repetition required flag to indicate that there is no data reception during the preset time period and that data repetition is required;

decrements the third counter; and

resets the timer.